Opportunities and Challenges
Green Collar Jobs Council

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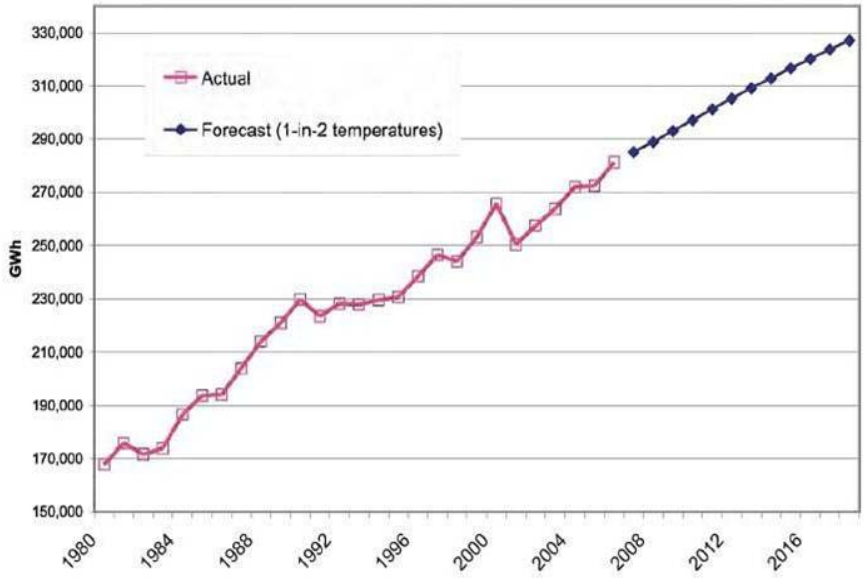
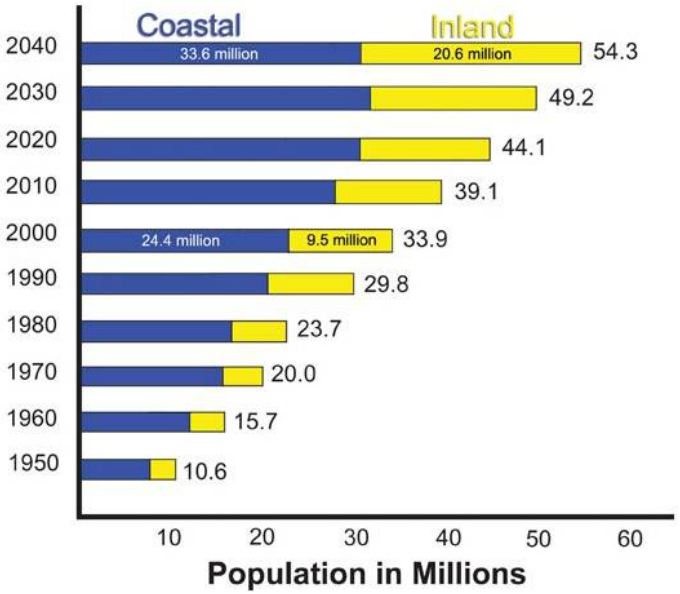
What is CALSEIA?

- **CAL**ifornia **S**olar **E**nergy **I**ndustries **A**ssociation
- Founded in 1977
- Mission: to expand the use of all solar technologies in California and establish a sustainable industry for a clean energy future
- Membership comprised of solar companies: manufacturers, distributors, contractors, engineers, designers, utilities

Energy Challenges Will Persist

- Total demand will grow
- Population moving to locations where cooling is more important
- Climate change will force change in energy consumption
- Climate change will force change in generation choices





The Big Picture Mission

- Lower energy bills for those who need it most
- Health: reducing heat-related deaths and natural gas emissions within the ‘pedestrian bubble:’ particulates
- Air quality: natural gas SOx, NOx, particulates
- Greenhouse Gas Emissions
- Jobs
- Community based energy
- Fairness

Do it in the Right Order

- Reduce demand (the thermostat setting)
- Energy Efficiency (replace the air conditioner, caulk, insulate, seal ducts, etc.)
- On site energy production
  - Solar Water Heating (SWH)
  - Solar Electric (PV)
- Distributed Renewable Generation
- Utility Scale Generation

Solar Technologies
(in order of cost per kWh or Btu)

- Energy Efficiency (not a solar technology but essential to lowering installed cost of solar technologies)
- Solar thermal (water heating, process energy, space heating, space cooling, pool heating)
- Solar thermal electric generation
- Solar electric Photovoltaic (grid connected/no storage)
  - Polymer (not available in large volume yet, currently lowest efficiency)
  - Thin Film (currently lower efficiency means greater surface area needed)
  - Silicon (highest efficiency means less surface area needed)

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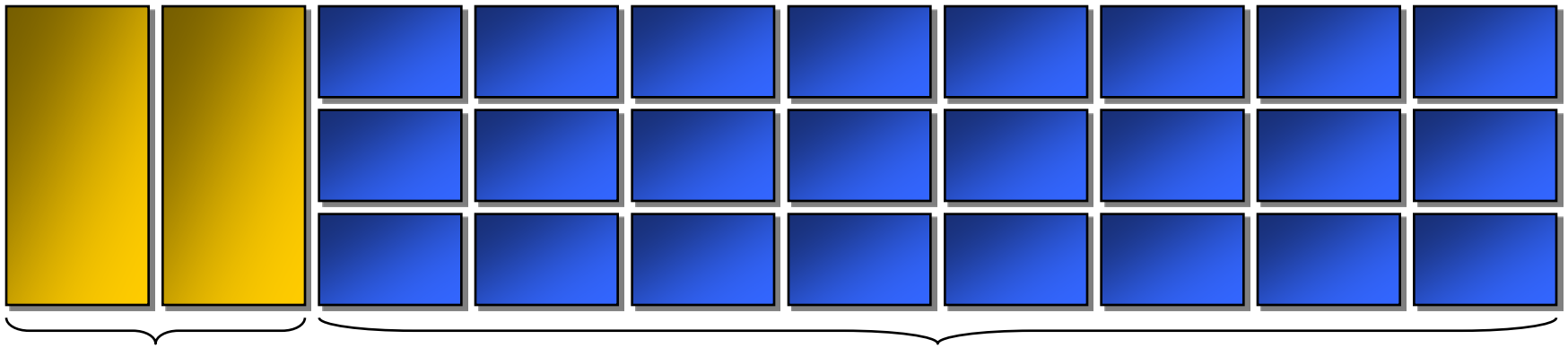
Comparing PV and Solar Thermal

Right Technology For The Job

Hot water needs: shower, laundry, dishwashing, etc.

Electricity needs: refrigerator, lighting, plug in devices



SHW (HELIODYNE GOBI 410)

Output/day[1]:	22.7 kWh_{th}
Area:	80 ft^2
Installed cost:	$7,000

= 1 to 7

PV (Shell SQ 165-PC)

Output/day[2]:	22.3 kWh
Area:	456 ft2
Installed cost:	$51,480

1: Peak output based on SRCC Category C Clear Sky for SHW (Equivalent kWh derived using 3,414 Btu/kWh)
2: Manufacturers spec sheet for PV at standard test conditions (5.28 kW array rating x 5.8 peak sun-hrs/day)

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Energy Policies Applicable to Solar Many Moving Parts

- Federal Energy Policies
  - Incentives (tax credits recently renewed through 2016)
  - Accelerated depreciation (bonus depreciation expired but may be reinstituted
- State Energy Policies
  - California Solar Initiative: 3,000 MW by 2016, ratepayer funded rebates
  - California Solar Water Heating Efficiency Act (not yet implemented: 200,000 SWH by 2017)
  - Goals (loading order, zero energy buildings)
  - Tariffs (time of use rates, dynamic pricing, AB1x, demand charges)
  - Mandates (building efficiency standards, Renewable Portfolio Standard, RECs)
  - Other Incentives (property tax exclusion, net metering)
  - Distributed generation – Feed in Tariff Policy
- State Climate Change Policies (AB 32, GHG regulations)
- Local Policies
  - Financing programs (fixing problem with federal tax credit, not including energy efficiency and solar thermal
  - Green Building Initiatives
  - Local rebate programs
- Utility Programs (Education, Wholesale PPA, Utility ownership, Interconnection)

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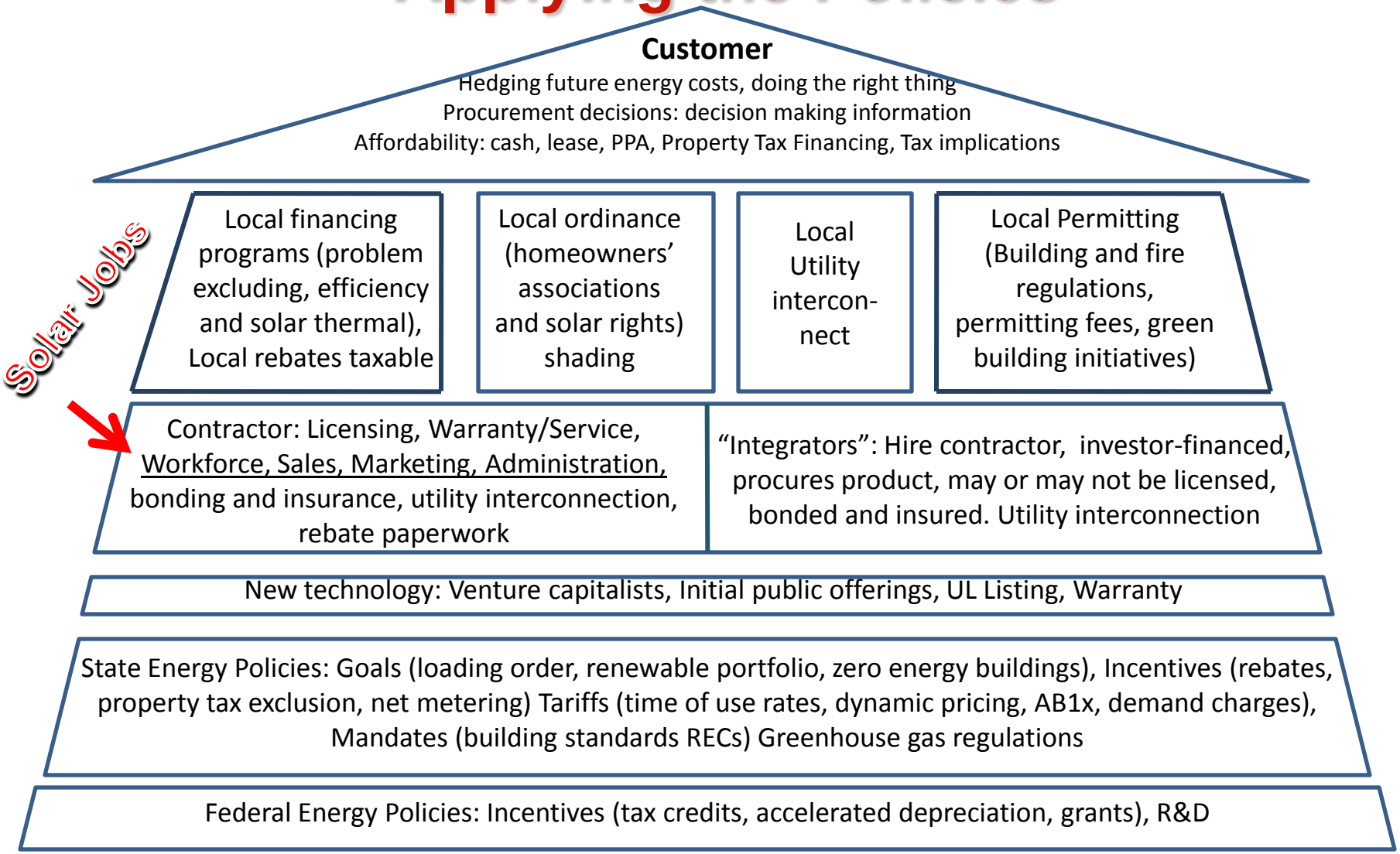
Applying the Policies



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Beware the Hype about those Installation Jobs

- Not as many as the news would lead you to believe
  - Near term sales affected by financial markets for both residential and commercial markets
  - Residential sales affected by job losses, loss of equity, tighter lending markets, loss of homes, fear of debt
  - Solar projects are cyclical and short term projects
  - Solar projects follow the customer

Jan 07-Jan 09 – total number of installations	PG&E	SCE	San Diego
Residential and small commercial (<30kW)	9,226	3,313	1,213
Commercial, non-profit, government (>30kW≤1MW	637	286	78

14 companies installed more than 60% of these projects

- Manufacturing: Research/start-up companies, silicon chip (San Jose), SolarWorld (Camarillo), SunEarth (Fontana), Heliodyne (Richmond), FAFCO (Chico), Solyndra (Fremont), component manufacturers

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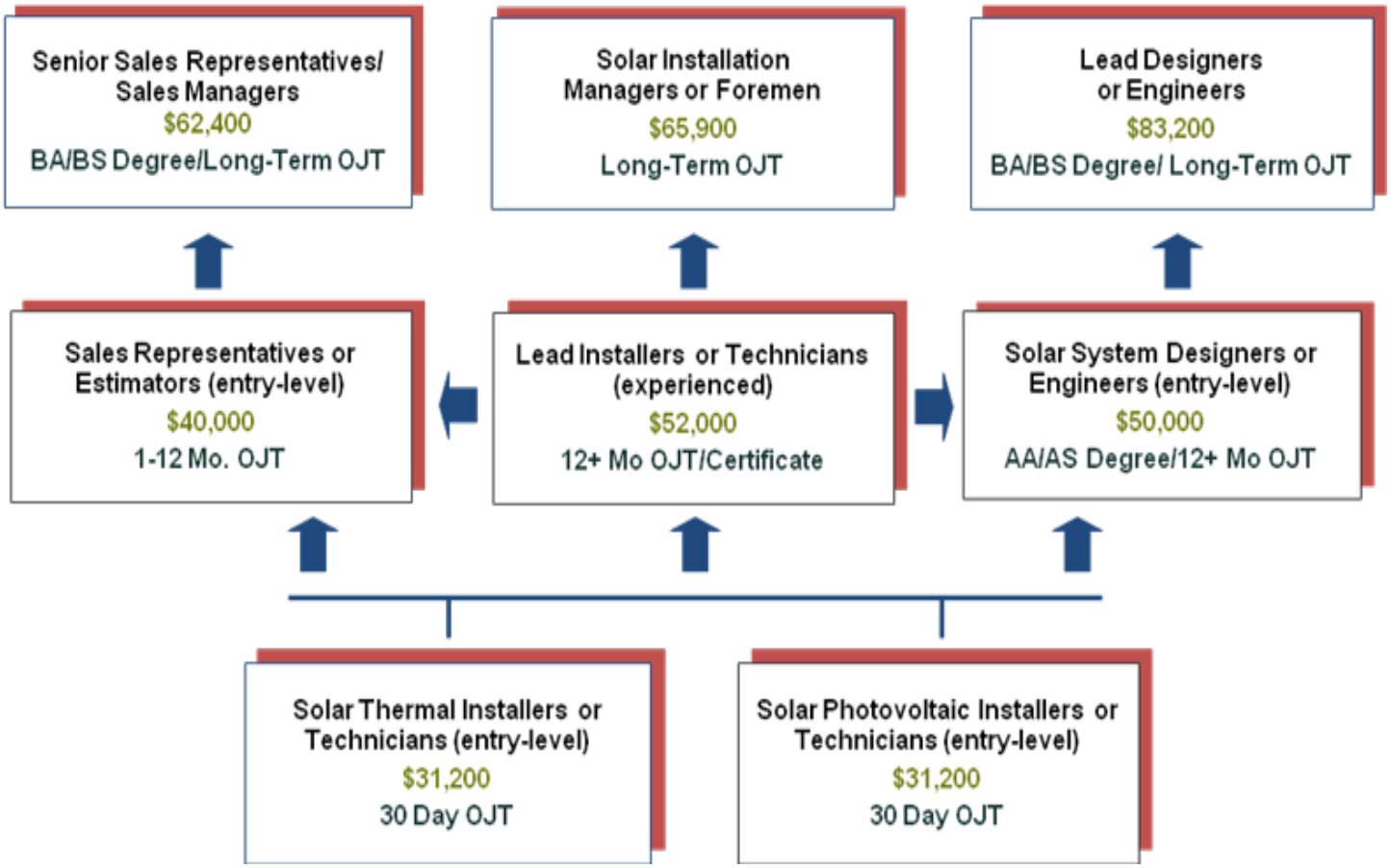
Really Important Job Info

- Major qualifications for installers and helpers: Shows up on time, has valid driver's license, not afraid of heights, can safely climb up and down a ladder and work on a roof, follows instructions accurately and safely, polite to customers, likes to work in 140^{o} with no shade in the summer or on a cold, wet day in the winter on a steep roof, knowledge of technology
- Other jobs seldom discussed: Energy use assessors, Sales, administration, inventory, data processing, panel cleaning

Cal Community College Solar Study



Job Training – a work in progress

- Standardization
  - Lack of Standard training: an employer does not know if a graduate from School X has the training to be ready to work
  - Technology not Standardized
  - Installation not Standardized
- Pre-apprentice programs (Cypress Mandela)
- Shout out to Homeboy Industries, LAUSD/IBEW: Brian Hurd
- Union Apprenticeship Schools
- Community Colleges starting to standardize but the majority are focusing on PV installer training right now (but if I can help it, they will add SWH, sales, estimating, administration)

Fun Pictures

Guess which one is the solar thermal project

Thank you!

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